Patent claims

1. A cylinder head cover (1) for covering a cylinder head of a combustion engine, with an oil separator for separating oil and/or oil spray from the blow-by gas of the combustion engine, characterised in that
the oil separator comprises:
at least one flow-through tube (10) with an inlet (12) for the blow-by gas and with an outlet (13) for the blow-by gas and for the separated oil, said outlet being arranged downstream of the flow-through tube (10) with regard to the gas flow,
wherein the at least one flow-through tube (10) with its longitudinal axis (14) in the flow-through direction is essentially arranged in the plane of the cylinder head cover defined by the longitudinal and transverse extension of the cylinder head cover (1)
at least one first worm-like segment (20) arranged in the at least one flow-through tube (10),
wherein the thread surfaces (21) of the worm-like segment (20), with the wall (11) of the flow-through tube, form at least one spiral flow path (22) with a smallest cross section of between 1 mm^2 and 800 mm^2.

2. A cylinder head cover (1) according to the preceding claim, characterised in that the thread surfaces (21) of the worm-like segment (20), with the wall (11) of the flow-through tube form at least one spiral flow path (22) with a smallest cross section ≥ 2 mm^2 and/or ≤ 400 mm^2, preferably ≥ 4 mm^2 and/or ≤ 200 mm^2

3. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least two flow-through tubes are arranged parallel to one another with respect to the flow-through direction.

4. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least the at least one flow-through tube (10) is not arranged perpendicular to the plane of the cylinder head cover (1).

5. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least the at least one through flow tube (10) is arranged at an angle $\leq 70°$, advantageously $\leq 45°$, advantageously $\leq 30°$ advantageously $\leq 15°$ to the plane, advantageously in the plane of the cylinder head cover (1).

6. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least in the at least one flow-through tube, at least one first and a second worm-like segment (20) are arranged one after the other in the axial direction.

7. A cylinder head cover (1) according to the preceding claim, characterised in that the at least two worm-like segments (20) have rotational directions of the thread surfaces (21) and flow paths (22) which are in equal rotational directions to one another.

8. A cylinder head cover (1) according to claim 6, characterised in that the at least two worm-like segments (20) have rotational directions of the thread surfaces (21) and flow paths (22) which are in opposite rotational directions to one another.

9. A cylinder head cover (1) according to one of the claims 6 to 8, characterised in that the at least two worm-like segments (20) in the axial direction are arranged directly connecting to one another or with a positive fit.

10. A cylinder head cover (1) according to the preceding claim, characterised in that the at least two segments (20) in the axial direction are arranged at the beginning, in the middle or at the end of the flow tube.

11. A cylinder head cover according to one of the claims 6-8, characterised in that the at least two segments are arranged separated from one another in the axial direction.

12. A cylinder head cover (1) according to one of the claims 6 to 11, characterised in that the thread surface of the second segment (20) at least partly projects into the flow path (22) formed by the thread surface of the first segment (20).

13. A cylinder head cover (1) according to the preceding claim, characterised in that the thread surface of the second segment (20) projects roughly up to the middle into the flow path (22) formed by the thread surface of the first segment (20).

14. A cylinder head cover (1) according to one of claims 6 to 13, characterised in that at least one of the edges of the thread surface of the second segment (20), said surface projecting into the flow path (22) formed by the thread surface of the first segment (20), comprises a flange or raised part (26b) directed opposite to the flow direction.

15. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least one of the segments (20) comprises at least two flights or flow paths (22) which are arranged next to one another with respect to the axial direction.

16. A cylinder head cover (1) according to the preceding claim, characterised in that each of the segments (20) comprises at least two flights or flow paths (22).

17. A cylinder head cover (1) according to one of the preceding claims, characterised in that the flow paths (22) run at an angle of approx. 45° to the axial direction of the flow tube.

18. A cylinder head cover (1) according to one of the preceding claims, characterised in that the inlet (12) is arranged in a manner such that the flow tube has an inflow at an angle ≤ 45° to the axial direction or at an angle ≤ 45° to the tangent on the periphery of the flow-through tube (10).

19. A cylinder head cover (1) according to the preceding claim, characterised in that the inlet (12) is arranged in a manner such that the flow tube has an inflow which is axial or tangential to its periphery.

20. A cylinder head cover (1) according to one of the preceding claims, characterised in that the outlet is arranged in a manner such that the blow-by gas flows out of the flow tube at an angle ≤ 45° to the axial direction or at an angle ≤ 45° to the tangent on the periphery of the flow-through tube (10).

21. A cylinder head cover (1) according to the preceding claim, characterised in that the outlet is arranged in a manner such that the blow-by gas flows out of the flow tube axially or tangentially to its periphery.

22. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least one of the worm-like segments has a length between half a pitch and 2.5 pitches, a pitch corresponding to the length of a segment (20) with a complete revolution of the thread surfaces (21) by 360°.

23. A cylinder head cover (1) according to one of the preceding claims, characterised in that the flow tube is conically widened towards the inlet (12) and/or towards the outlet (13).

24. A cylinder head cover (1) according to one of the preceding claims, characterised in that the tube at its thinnest location or at its entire length has a diameter ≤ 30 mm, preferably ≤ 25 mm, preferably ≤ 12 mm, preferably ≤ 7 mm.

25. A cylinder head cover (1) according to one of the preceding claims, characterised in that the tube at its thinnest location or on its entire length has a diameter of ≥ 4 mm, preferably ≥ 7mm.

26. A cylinder head cover (1) according to one of the preceding claims, characterised in that the wall thickness of the thread surface at its thinnest location or on its entire length ≥ 1/20 and/or ≤ 1/2, advantageously ≥ 1/10 and/or ≤ 1/3 of the diameter of the flow-through tube (10).

27. A cylinder head cover (1) according to one of the preceding claims, characterised in that the pitch of the worm ≥ 1/8 and/or ≤ tenfold, advantageously ≥1/4 and/or ≤ fivefold, advantageously ≥ 1/2 and/or ≤ twice, the diameter of the flow-through tube (10).

28. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least one of the segments in the axial direction at the beginning and/or at the end or on the entire length has no axial core.

29. A cylinder head cover (1) according to one of the preceding claims, characterised in that at least one of the segments in the axial direction at the beginning and/or at the end has an axial core of the worm-like segment (20), said core being conically thickened towards the beginning or end.

30. A cylinder head cover (1) according to one of the preceding claims, characterised in that for at least one of the segments (20) the distance between the core of the worm-like segment (20) and the wall of the flow tube reduces in the axial direction.

31. A cylinder head cover (1) according to the preceding claim, characterised in that for at least one of the segments, the radius of the core of the worm-like segment (20) and/or the diameter of the flow tube reduces in the axial direction.

32. A cylinder head cover (1) according to one of the preceding claims, characterised in that one or more grooves or axial channels are arranged in the wall of the flow tube, advantageously in essentially the axial direction, and/or in the thread surfaces of at least one worm-like segment, advantageously in essentially the flow direction of the blow-by gas, advantageously on the outer edges of the thread surfaces.

33. A cylinder head cover (1) according to one of the preceding claims, characterised in that one or more webs are arranged on the wall (11) of the flow tube, advantageously

in essentially the axial direction and/or in the thread surfaces of at least one worm-like segment, advantageously in essentially the flow direction of the blow-by gas.

34. A cylinder head cover (1) according to one of the preceding claims, characterised in that for at least one of the segments, the pitch within the segment (20) at least in sections increases or reduces in the axial direction.

35. A cylinder head cover (1) according to one of the preceding claims, characterised in that the pitches of the individual segments in the axial direction increase or reduce with respect to the preceding segment (20).

36. A cylinder head cover (1) according to one of the preceding claims, characterised in that the flow tube has an initial segment in which no worm-like segments (20) are arranged.

37. A cylinder head cover (1) according to the preceding claims, characterised in that the initial section in which no worm-like segments (20) are arranged has a length $\geq$ 10 mm.